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The first method -- branch feeder lines -- is widely employed in cities and regional centers. Its advantages are economical operation, guaranteed service to subscribers, and possibilities for serving additional subscribers. The equipment for such radio centers is available. Enterprises of the Ministry of Communications and the Ministry of the Communications Equipment Industry are producing the necessary types of radio receiving public-address units with a power of 50 watts to 5 kilowatts. Work has been somewhat retarded by the demand for telegraph poles and wire, but this has now been overcome. In recent years, progress has been made in laying underground cables with polyvinyl chloride insulation. Operating experience has borne out their high quality and lower costs.

These feeder networks were used during 1948 - 1949 in introducing radiofication into several oblasts of the USSR in conjunction with the newly evolved people's construction method in which the agricultural population, Party, Komsomol, and other organizations all take part in the work. Moscow Oblast set the example, and was followed by Kursk, Sverdlovsk, Orlov, Gorkiy, Kuybyshev, Ul'yanovsk and Pskov oblasts, Krasnodar and Stavropol krais, and many other places in the USSR. There is every indication of further development of radiofication through high-power central units and branch network systems, especially in densely populated districts.

The radiofication of rural districts by radio centers of medium power with self-contained power supply or supplied by kolkhoz electric power stations is less profitable and presents many operating difficulties. Nevertheless, this method is widely used at present, especially in districts some distance from large power systems. Centers with self-contained power supplies will be more widely distributed in the next few years, ~~and~~ <sup>but</sup> will gradually ~~take the place~~ <sup>give way to</sup> of small kolkhoz radio centers.

It should be noted that small kolkhoz centers can utilize reserve power sources, namely, wind power. They can also be powered through telephone lines. This increases stability of reception, as compared with that of individual receivers.

Small centers can transmit only one program. Moreover, they require a special man to switch the network on and off and to regulate the operation of the installation. But these defects are not vital.

A small kolkhoz radio center must assure the operation of 40-50 radio (loudspeaker) points. This requires a power of 1-2 watts, on the basis of a sound pressure at each subscriber's loudspeaker of 2 dynes per square centimeter at a distance of one meter, using a loudspeaker of the Rekord type. It must have a universal supply, i.e., ability to operate on dry batteries, on AC lines with reserve storage batteries charged by selenium rectifiers, or on AC wind-charging equipment. Such networks are usually made with underground cables insulated with vinylchloride. Accelerating the production and introduction of such radio centers will undoubtedly facilitate radiofication of villages and is one of the important tasks of 1950.

The great field intensity of our powerful broadcasting stations will make possible extensive use not only of tube but also of crystal receivers. Several types of low-cost crystal receivers are being produced in series. Utilization of crystal sets is, of course, limited to zones of great field intensity -- 5-10 millivolts per meter -- and, therefore, the number of listeners will be relatively small. Nevertheless, this will comprise a supplementary reserve contributing to the rapid development of receiving networks in rural districts.

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It must be admitted that crystal sets are not very popular in these districts. Their price is relatively high, and modern techniques have not been fully employed in building them. A good crystal set should be developed at the earliest possible date.

Up to the present, few tube receivers have been available in rural districts. Recently, the Ministry of Communications Equipment Industry has developed some fair AC models at a comparatively low price. The three-tube Moskvich set turned out by the Aleksandrov Plant is one; it should prove useful in rural districts with reliable AC power networks.

The situation in regard to battery receivers is even worse. The only receiver of this type, the Rodina in spite of all its good qualities, is unsatisfactory from the viewpoint of electric power consumption and high initial cost. In addition, the scarcity of batteries and tubes keeps a large number of the sets inoperative.

Although the four-tube Iskra receiver consumes only half as much power as the Rodina, it does not solve fully the receiver requirements of rural districts. Economical long-life tubes should be made especially for rural mass-produced receivers with several tubes combined in one envelope.

Also, it is time to manufacture more durable batteries with a sloping discharge characteristic, which will ensure receiver operation within the limiting values of discharge voltages.

Attention must also be paid to increasing the efficiency of loudspeakers. The present electromagnetic and electrodynamic loudspeakers have an efficiency of 1-2 percent.

The Design Bureau of the Ministry of Communications has designed an economical loudspeaker using Rochelle salt crystals. It has an efficiency of over 20 percent. With a power consumption of 5 milliwatts, it creates a sound pressure of 2-2.5 dynes per square centimeter at a distance of one meter along the axis of the loudspeaker. However, although its power consumption, good qualities, and price would make it suitable for mass rural radiofication, wartime experience has demonstrated the shortcomings of piezoelectric loudspeakers. Since crystals lack durability and are affected by moisture and temperature changes, new crystal speaker designs should be carefully checked before being introduced into rural districts.

Radiofication of cities and industrial districts can be facilitated by means of wired radio networks from powerful radio centers.

Tube receivers of all types should be used more widely. But the advantages of radio receivers sometimes cannot be fully realized because of the high level of man-made interference. To ensure high-quality multiprogram broadcasting in cities, especially those with inhabitants of many nationalities, full use must be made of frequency compression in wired broadcast networks.

This system makes it possible to transmit as many as three additional programs, besides the main program transmitted to the loudspeakers at a high-level for listeners with two-tube receivers. Such an installation will be 20-30 percent cheaper than the simplest tube receivers now on the market.

Extensive use should be made of ultrashort wave FM (frequency modulation) transmission in large, densely populated, industrial districts, due to the well-known advantages of FM, low-cost, noise-free reception, etc.

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Large-scale development of ultrashort-wave broadcasting will greatly facilitate transition to the next stage in radiofication, namely the introduction of television in the capitals of the union republics and in large industrial centers.

To develop radiofication on the scale envisaged by governmental decree, a system of agencies must be established, especially in rural districts, to supervise the servicing and construction of receiving networks. These agencies will also supervise the maintenance of receivers and loudspeakers. Special technician-instructors will make periodic spot checks on maintenance of the equipment. The agencies must have at their disposal skilled workmen, equipment for making repairs and checking radio centers and receivers, traveling instructors, stocks of material, tubes, spare parts, and power supplies. The establishment of such agencies is too important to be postponed.

The availability of materials at outlying commercial centers, as well as in oblast centers, is vitally important for assuring reliable operation of kolkhoz radio networks.

The necessary skilled technicians can be developed by training kolkhoz amateur radio technicians, demobilized signal men from the Soviet Army, and active members of the Komsomol. Brigade-individual training methods should be used as well as lecture courses. DOSARM organizations and the Komsomol can render great assistance in this connection.

The Main Administration of Radiofication of the Ministry of Communications and local communications agencies must make full use of the great potentialities provided by the "Decree on Measures to Promote Radiofication of the USSR," leaning heavily on Party and Komsomol organizations where possible. The public, DOSARM clubs, schools, and educational organizations can also do their part by popularizing radio and supervising the programs in individual kolkhozes. Thus, by full cooperation of all concerned, our country should approach the final stage of radiofication by 1955.

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